MG811 CO2 Sensor

Features

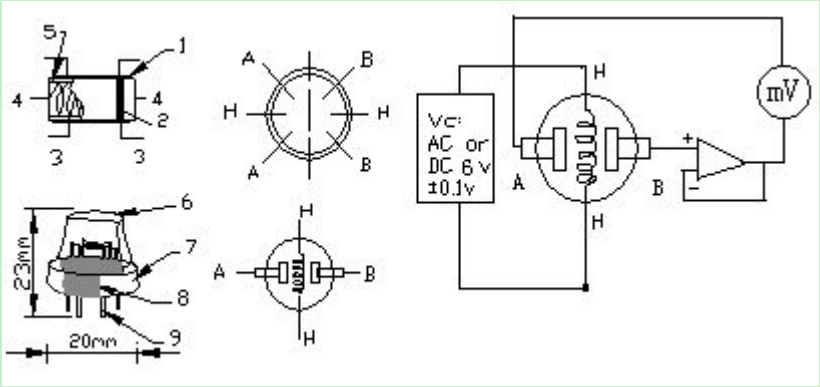
Good sensitivity and selectivity to CO2
Low humidity and temperature dependency
Long stability and repeatability

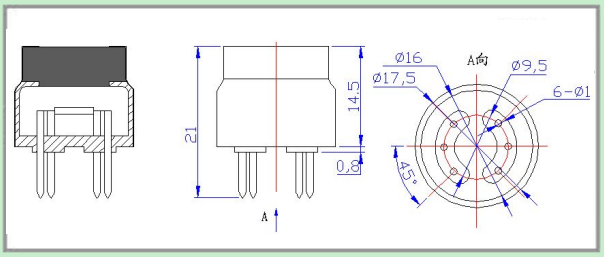
Application

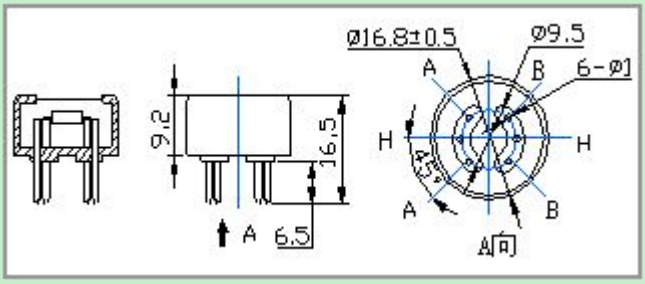
Air Quality Control
Ferment Process Control
Room Temperature CO2 concentration Detection

Structure and Testing Circuit

Sensor Structure and Testing Circuit as Figure, It composed by solid electrolyte layer （1），Gold electrodes（2），Platinum Lead （3），Heater ⑷，Porcelain Tube ⑸，100m double-layer steeless net（6），Nickel and copper plated ring（7），Bakelite (8)，Nickel and copper plated pin（9）。







Working Principle

Sensor adopt solid electrolyte cell Principle，It is composed by the following solid cells：

Air，Au|NASICON|| carbonate|Au, air，CO2

When the sensor exposed to CO2，the following electrodes reaction occurs：

Cathodic reaction：2Li + + CO2 + 1/2O2 + 2e - = Li2CO3

Anodic reaction：2Na+ + 1/2O2 + 2e- = Na2O

Overall chemical reaction：Li2CO3 + 2Na + = Na2O + 2Li + + CO2

The Electromotive force（EMF） result from the above electrode reaction, accord with according to Nernst's equation:：

$EMF = Ec - (R \times T) / (2F) \ln (P(CO_2))$

$P(CO_2)$—CO2--- partial Pressure Ec—Constant Volume R—Gas Constant volume

T— Absolute Temperature （K）F—Faraday constant

From Figure 1B，Sensor Heating voltage supplied from other circuit , When its surface temperature is high enough , the sensor equals to a cell, its two sides would output voltage signal ,and its result accord with Nernst's equation。 In sensor testing, the impedance of amplifier should be within 100—1000GΩ，Its testing current should be control below 1pA.

Specifications ：

Symbol	Parameter Name	Technical parameter	Remarks
V_H	Heating Voltage	6.0±0.1 V	AC or DC
R_H	Heating Resistor	30.0±5%Ω	Room Temperature
I_H	Heating Current	About 200mA	
P_H	Heating Power	About 1200mW	
Tao	Operating Temperature	-20—50℃	
Tas	Storage Temperature	-20—70℃	
ΔE M F	Output Signal	30—50mV	350—10000ppmCO2

Sensitivity ：

Figure 2 shows gas sensor sensitivity curve. ：

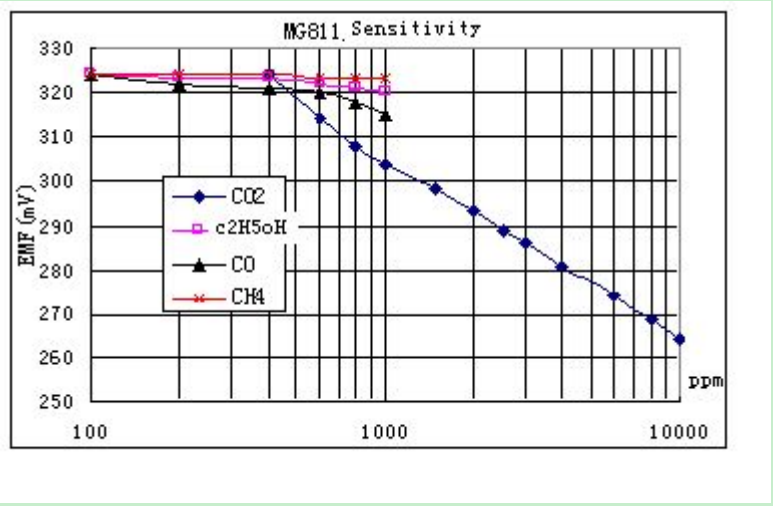
Conditions:

Tem ： 28℃、

RH：65%、

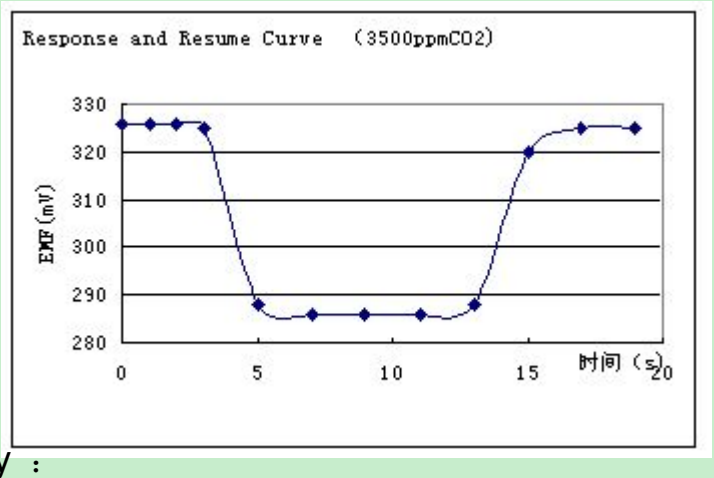
Oxygen concentration ： 21%

EMF: sensor EMF under different gas and concentration .



Response and Resume Characteristic：

Figure 3 shows Solid electrolyte sensor has good response and resume characteristics.



Temperature and Humidity Dependency ：